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CMM PDE Seminar

Speaker: Juan Carlos Pozo, Universidad de Chile.

Title: "Differential-difference equations arising in number theory."

Abstract: In an attempt to find a more intuitive proof of the Prime Number Theorem, Lord Cherwell derived, through heuristic arguments, the equation:

$$f'(x) = -(f(x)\, f(\sqrt{x})/(2x),$$

where f(x) represents the "density of primes at x". Through a simple change of variables, the differential equation can be rewritten as the following delay differential equation:

$$h'(u) = -(\ln 2)(h(u) + 1)h(u - 1),$$

which marks the first appearance of this type of equation in number theory. In this talk, we present other families of differential equations, both with delay and advance, related to various problems in number theory. Regarding these equations, we will explore some known results and emphasize the importance of studying the asymptotic behavior of their solutions. With this in mind, we will provide global bounds for the solutions using the theory of regularly varying functions.

Venue: DIM seminar room, Beauchef 851, 5th floor.
Monday, december 16th at 12:10 pm.

Zoom:
https://uchile.zoom.us/j/96642349167?pwd=MkRVbWxzOFBUUXlCTWFicW0reWZ6dz09

For further information, see our webpage: https://eventos.cmm.uchile.cl/pdeseminar/